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Device for filling material in powder form, more particularly flour into packs.

Applicant: Edoardo Amadessi, Spilamberto, Modena (Italy)

Representative: Dipl.-Ing. A. Lehmann and Dipl.-Ing. E. Eder, patent agents
Munich 23, Ohmstr. 16

Edoardo Amadessi, Spilamberto, Modena (Italy) is named as the inventor.

The invention relates to a device for filling material in powder form, more particularly flour, into packs, with a horizontal worm screw transferring the material from a collective container into the pack, on the housing of which a sleeve for holding the pack is arranged, a carrier for the packs displaceable horizontally against the effect of a weight, against which the base of the package which is filling and moving away from the screw rests and with a control device, which at the end of the filling process automatically switches off the drive for the worm screw.

In such a known device the sleeve for holding the bag-shaped pack is longitudinally displaceable so that the sleeve remains in the pack during the filling procedure. Filling the pack to bulging is not therefore possible.

Furthermore, no even pressing of the filling material can be achieved as there is no compression chamber before the conveyor screw. It is also not possible to obtain a precisely dosed quantity of filling material in the pack at the end of the automatically switched off filling process as no precise separation of the filled material from the material remaining in the conveying screw is possible. Control devices for conveyor screw dispensing machines have already become known in which the control device for switching of the conveyor screw drive is adjustable along a scale, but here switching off takes place depending on the number of revolutions of the conveyor screw corresponding to the desired filling quantity. Precise dispensing in accordance with the weight required at the time is not possible here.

The aim of the invention is to create a simply designed device for filling material in powder form into packs which allows the filling of a quantity of filled material corresponding exactly to a desired weight, compressed and bulging filling of the pack, whereby the changing relationship between specific weight and spatial content can be taken into account in accordance with the changing degree of humidity.

The invention achieves this objective in that the sleeve borne on the conveyor screw housing is arranged in a rotatable but not longitudinally displaceable manner and at the end at which the filling material emerges has cutting wires for cutting the strand of

filling material, and in that between the end of the conveyor screw and the outlet end of the housing a free filling material compactor chamber is provided and the control device for switching off the conveyor screw drive is adjustable along a scale in the known manner.

As the sleeve is no longer displaced with the pack during the filling process, but the pack is gradually pulled from the sleeve, the pack is filled full evenly as filling of the material into the pack takes place against a constantly acting force. As a filling material compacting chamber is available, the desired filling material quantity takes up a smaller space and the filling material strand can be separated precisely at the filling material outlet end of the sleeve after the filling process has been automatically switched off at the right moment.

This invention will be described below in more detail with the aid of an example of embodiment shown in the drawing, wherein

Fig. 1 shows a schematic view, partially in longitudinal section of the device in accordance with the invention.

Figs. 2 and 3 show views from above of individual features of the device.

The filling device has a conventional filling hopper 1 into which the material to be filled, e.g. flour, is supplied. The material is constantly moved in the hopper by means of known stirring devices and transferred from there into cylinder 3, in which the worm screw 2 rotates. Arranged concentrically to the work screw housing 3 is a sleeve 4, which is rotatable vis-à-vis the worm screw housing but not longitudinally displaceable. At the filling material outlet end 5 the

sleeve 4 has two or more tensioned cutting wires. The cutting wires allow the material to pass through in the direction of the arrow 6, but cut through it when the sleeve 4 is rotated by operating its grip 7.

The filling hopper 1 has two stirrers 8 and 9 which are shown in the outline in figs. 2 and 3 respectively. The stirrers 8 and 9 rotate at a speed proportional to that of the worm screw 2. The S-shaped stirrer 9 also serves to forward the material into the cylinder 3. Between the end of the worm screw 2 and the filling material outlet end 5 of the sleeve 4 a free space 16 is provided, which is used for compacting the material. Arranged before the filling material outlet end 5 is a carrier 10, which runs on rails, which on its upper side has an arched support surface for the bag-shaped pack to be filled.

The carrier 10 is constantly pulled against the filling material outlet end 5 by a weight 11, connected to it through a cable, which runs via a deflecting roller.

Applied at the side of the wagon 10 is an indicator 12 which is moveable and fixable on a rod.

The side wall of the carrier 10 is provided with a scale 13.

On the base plate of the device there is an on/off switch 14 for the drive motor of the worm screw. The switch 14 is operated by the indicator 12 when the latter is moved over the switch.

The device operates as follows:

The pack to be filled is pushed over the sleeve 4 until the base of the bag rests against the filling material outlet end 5. The wagon 10 is moved towards the filling

material outlet end 5 until the vertical base 15 is resting on the filling material outlet end 5. The worm screw motor is switched on. The material being gradually pressed against the base of the pack moves the carrier 10, against the effect of the weight 11, from right to left in the drawing. As soon as the required weight (1, 1 ½ etc. kg) is reached the motor is switched off. By operating the grip 7 the compacted filling material strand is cut off, whereupon the filled material quantity is weighed. If the weight is correct the indicator 12 is fixed at the appropriate point. The device is thus always switched off precisely when the required and set weight is reached.

Filling process

After the desired weight has been set, pack after pack can be pushed over the sleeve 4 and the carrier moved to the base of the pack. The device is then switched on and one waits until the pack has been filled and the device automatically switches off. The filling strand is then separated and the filled pack removed etc.

The device in accordance with the invention allows:

1. The filling material to be compacted as required; the compacting of the material depends on the distance 16 between the worm screw and the end of the worm screw housing as well as the size of the weight 11;
2. Precise dispensing to be carried out, irrespective of the degree of humidity of the material and its specific weight.

As the sleeve 4 can be easily changed, the most varied packs can be taken into consideration.

CLAIMS

1. A device for filling material in powder form, more particularly flour, into packs, with a horizontal worm screw transferring the material from a collective container into the pack, on the housing of which a sleeve for holding the pack to be filled is arranged, a carrier for the packs displaceable horizontally against the effect of a weight, against which the base of the pack which is filling and moving away from the screw rests and with a control device, which at the end of the filling process automatically switches off the drive for the worm screw characterised in that the sleeve (4) borne on the conveyor screw housing (3) is arranged in a rotatable but not longitudinally displaceable manner and at the end at which the filling material emerges has cutting wires (18) for cutting the strand of filling material, and in that between the end of the conveyor screw and the outlet end of the housing a free filling material compactor chamber is provided and the control device for switching off the conveyor screw drive is adjustable along a scale in a known manner.
2. The device in accordance with claim 1, characterised in that the displaceable carrier (10) for the pack only has one arched horizontal surface and a support surface (15) perpendicular thereto for the gradually filling pack.
3. The device in accordance with claim 1, characterised in that the carrier (10) for the pack laterally has a longitudinally adjustable and fixable indicator (12), to which a scale (13) provided on a carrier is allocated, and in that on the base plate there is a switch (14) operating in

conjunction with this indicator for the motor driving the worm screw.

4. The device in accordance with claim 1, characterised in that a supply hopper (1) is provided in which two stirrers (8 and 9) are arranged on top of each other, which are driven by the motor operating the worm screw (2).

Documents taken into consideration:

German patent specifications nos. 669 900, 742 026, 921 793, 965 115;

British patent specifications nos. 210 614, 495 081.

1 sheet of drawings attached